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**Instructor's Manual and Test Bank**  
*to accompany*

# **Learning and Cognition** **The Design of the Mind**

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## INTRODUCTION

Welcome to the first edition of *Learning and Cognition: The Design of the Mind*. My goal in writing this textbook was to present what is known about the human mind in a form that is as interesting and engaging as possible. As you read the book, I hope you will find that our current knowledge of the mind weaves together into a fascinating story.

Too often, students in university courses get the impression that theories of learning and cognition are scattershot—constellations of facts and findings that might seem important in isolation, but that don't really hold together. A lack of coherence makes teaching difficult for instructors, who are responsible for telling the “story” of the human mind in a form that is as interesting as possible. Fortunately, theories of human learning and cognition really are fascinating, as well as applicable in academic and everyday contexts. Even better, they hold together as an articulated whole. It's up to us, as instructors, to convey this to our students.

I hope that my book will assist you in this quest. Of course, a textbook is secondary. You, as instructor, have the primary role in presenting information in a way that will spark the interest of your students. Ideally, the book and your instructional leadership will complement and reinforce one another so that the combination will add up to a truly excellent course. I see no reason why a course on learning and cognition shouldn't be the most rewarding experience in the program of any university student. After all, what is more compelling than the study of human intellect and its advancement?

### ***Test Bank***

To assist you, this manual includes a bank of test items for use in constructing examinations. The Item Bank consists of more than 200 multiple-choice and constructed response items.

The item bank is provided as a convenience. You may decide to assess the achievement of your students by means other than paper-and-pencil examinations. Even if you decide to use standard exams, you may have already assembled your own exams and wish to continue using those. If your items can be supplemented fruitfully by the Item Bank, so much the better.

As a rough guide to exam construction, here's my “formula”: I use 30 multiple-choice items and 6 constructed response items in both a midterm exam and a final exam. Students are instructed to answer only 5 of the 6 constructed response items. I then weight the items as follows:

30 MC x 2.5 points each = 75 points  
5 CR x 5 points each = 25 points  
TOTAL = 100 points

Of course, as instructor, you know what form of assessment, including specific test items, is most fitting for your students and most consistent with your own teaching philosophy. So, my “formula” for exam construction is only a suggestion. Use your own judgment to compose an assessment system that seems best to you and your students, whether that assessment involves the Item Bank or not.

In my view, teaching at the graduate level requires a separate appraisal of teaching and assessment. If you are teaching a graduate level course, you will have to decide whether or not to use written examinations. At times I have used traditional exams at the graduate level; but more often I have based course grades on other criteria, such as a course paper, participation and preparedness, and class presentation. In the end, it's up to you. Whether you choose to test your graduate students with traditional exams, perhaps drawing from the Item Bank, is likewise a personal decision that will depend on your own style, the needs of your students, and the traditions of your institution.

### ***PowerPoint Slides***

Along with the Test Item Bank, I provide a set of PowerPoint slides that follow the content and organization of the book. Like the Item Bank, the slides are for your use as you find them suited to your own pedagogical style. The slides can help keep the content organized for students and also help you to pace the presentation. The slides that accompany the textbook are rather “barebones.” You might want to embellish them with attractive graphics to bump up visual interest.

When you use the slides, you have a few choices. One option is to use supplementary notes when you lecture. If so, consider using the notes feature in PowerPoint. You can embed lecture material in the text box below the slide displayed on your screen, and then view your notes in Presenter Tools Mode. A second option is to elaborate content directly from your own understanding of the material.

Even if you present lectures, you need not do so exclusively. The structure of class meetings might also entail class discussion, group work, formative assessment, hands-on activities, and so on. My own preference is to use a lecture format that is sprinkled with discussion. In my classes, discussions are often prompted by student-generated questions and comments, which I sometimes solicit. Effective teaching can be accomplished through a wide range of approaches ranging from pure lecture to a highly student-centered teaching style marked by group projects and other more progressive methods. Use methods that work for you and your students, and whatever strategies conform best to your philosophy of teaching.

During a lecture, I project the slides onto the room screen, but I also routinely use the slides to generate handouts for students. In PowerPoint, I favor creating 3-slides-per-page handouts, which have the useful feature of lines for note-taking alongside thumbnails of the slides. At least twenty-four hours in advance of each class, I save pdf versions of these handouts and upload them to the course website. Students can print the handouts in advance of the class meeting or some simply download the handouts and take notes directly on their laptops.

The potential to create 3-slides-per-page handouts also works well when I teach graduate-level courses. In graduate courses, teaching from projected slides seems too didactic. Instead, I like to teach “seminar-style,” in which I am seated at a table with my students and we engage in highly interactive discussions over ideas. In such contexts, the handouts can be useful if I use part of the seminar to highlight concepts that students have already read about in advance of the meeting.

### ***Concluding Advice***

I wish you the best as you prepare for your teaching assignments. As you get ready to teach, I have some advice related to the course content and you, the instructor. On the content side, I suggest that you consider that the course content really is *inherently* interesting, important, and applicable to students. This guiding conviction about the ideas will give you confidence. The ideas don't need to be *made* interesting and relevant—they already are so. Communicating that truth is our responsibility as instructors.

Finally, a piece of advice on *what* to teach. Part of what you should teach, I believe, extends beyond the course content. In the textbook, I cite the advice of Liping Ma, “Do not forget yourself as a teacher of yourself.” If you are generally fascinated, even thrilled, by the subject of human learning and cognition, don't hide it. Let your enthusiasm be un-muted. There is little value in projecting an image of the staid and subdued academic. Your students will benefit much more by an authentic liveliness—and that means presenting yourself along with the material.

## Chapter 2: Behaviorism

### Multiple Choice

1. The study of learning in the 20th century was characterized by a major paradigm shift from:
  - a. cognitive science to social science.
  - b. behaviorism to social science.
  - c. cognitive science to information processing.
  - d. behaviorism to cognitive science.
2. One way to describe classical conditioning is:
  - a. stimulus reinforcement
  - b. stimulus conditioning
  - c. stimulus substitution
  - d. stimulus discrimination
3. Which of the sequences correctly describes Pavlov's classical conditioning during the training phase? (UCS: unconditioned stimulus; UCR: unconditioned response; CS: conditioned stimulus.)
  - a. UCS → UCR → CS
  - b. UCS → CS → UCR
  - c. CS → UCS → UCR
  - d. CS → UCR → UCS
4. Systematic desensitization is used to treat phobia patients. Which of the following is its theoretical basis?
  - a. operant conditioning
  - b. classical conditioning
  - c. successive approximation
  - d. response facilitation
5. Which one of the following responses is most likely learned through classical conditioning?
  - a. being apprehensive around lizards
  - b. working out at the gym
  - c. responding to a verbal greeting
  - d. completing a forty-hour work week

6. What best describes John Watson's position on the nature/nurture question:

- a. radically hereditarian (belief that genes determine behavior)
- b. radically situationalist (experience matters exclusively)
- c. interactionist (personal tendencies and experience interplay)
- d. nihilist (nothing can be said about the question)

7. A child becomes fearful of parades because every time a parade goes through his town, there are loud cannons and gunshots at the end of the parade. A classical conditioning model could explain this fear. In the model, the \_\_\_\_\_ would be the conditioned stimulus and the \_\_\_\_\_ would be the conditioned response.

- a. Fear...parade
- b. loud gunshots...fear
- c. parade...loud gunshots
- d. parade...fear

8. A misbehaving child is given "time out." After several minutes of good behavior, the child is then allowed to play with friends. Excusing the child from "time out" is an example of:

- a. continuous reinforcement.
- b. ratio-schedule reinforcement.
- c. negative punishment.
- d. negative reinforcement.

9. Imagine that you want to improve a distractible child's ability to sit still and listen in class. Which one of the following procedures illustrates how you might start to use shaping to do so?

- a. Explain the purpose of sitting quietly before reinforcement begins.
- b. Reinforce the child for sitting still on some occasions, but not others.
- c. Reinforce the child for sitting still and listening for only a minute, then for progressively longer and longer periods of time.
- d. Frequently change the specific consequence you use to reinforce sitting still and listening behavior.

10. Skinner's behaviorism lives! Which is not an example of behaviorism's continued influence in education?

- a. teaching higher order thinking
- b. ignoring bad behavior
- c. drawing "smiley faces" on students' work
- d. praising a student so that the student will repeat an action in the future

11. The term reinforcement is most directly associated with:
- a. information processing.
  - b. schema theory.
  - c. brain science.
  - d. behaviorism.
12. Which of the following is least compatible with Skinner's theory of operant conditioning?
- a. the Law of Effect
  - b. Watson's training of Little Albert to fear a rat
  - c. the Language Acquisition Device
  - d. the abandonment of the concept of freedom
13. Negative reinforcement has what effect?
- a. It makes the behavior more likely to occur.
  - b. It makes the behavior less likely to occur.
  - c. It has no predictable effect on the recurrence of a behavior.
  - d. It increases the self-efficacy of the behaving organism.
14. Which of the following is a significant risk of behavior modification?
- a. It can lead to punishment.
  - b. It can create anxiety.
  - c. It can decrease intrinsic motivation.
  - d. It can decrease self-efficacy.
15. Near the end of class, a teacher gives students free study time. Which example of the student's behavior during the study time and the teacher's response to that behavior best illustrates negative reinforcement?
- a. The student studies. The teacher praises the student.
  - b. The student studies. The teacher says student doesn't have to do homework.
  - c. The student wastes time. The teacher gives the student homework.
  - d. The student wastes time. The teacher takes away free time from student.
16. The reinforcement schedule that will produce the most robust behavior is:
- a. fixed interval
  - b. fixed ratio
  - c. variable interval
  - d. variable ratio

17. What was it about Tolman's mice that seemed to be a challenge to behaviorist ideas?
- a. When facing a T-juncture they always turned right.
  - b. They seemed to navigate the maze with a goal or purpose.
  - c. They exhibited decreased intrinsic motivation.
  - d. They acquired a phobia of Little Albert.
18. George has learned that if he pesters his father about using the car enough times, his father will eventually break down and give George the keys. George's pestering behavior is apparently being reinforced on a \_\_\_\_\_ schedule.
- a. differential rate of low responding
  - b. differential reinforcement of other behaviors
  - c. variable ratio
  - d. fixed interval
19. Operant conditioning is best able to explain which of the following psychopathologies?
- a. phobias
  - b. depression
  - c. addictions
  - d. hallucinations
20. Thorndike's observations of a cat trying to escape a puzzle box led him to conclude that learning is:
- a. a rapid process that occurs in one trial.
  - b. a process that is influenced by the motivation of the organism.
  - c. a gradual process that occurs through trial and error.
  - d. a process that is unaffected by the consequences of behavior.
21. The major effect of Thorndike's research on the study of Latin was to cast into doubt:
- a. the broad transferability of cognitive skills.
  - b. the genetic basis for measured intelligence.
  - c. the whole-language approach in the teaching of reading.
  - d. the situated quality of cognition.
22. Thorndike's Law of Effect is most like the ideas of:
- a. Pavlov.
  - b. Skinner.
  - c. Bandura.
  - d. Simon.

23. A behaviorist process of instruction involves identifying the goal of instruction and students' entry behavior, and then formulating substeps leading from the entry behavior to the terminal behavior, with each substep representing a small modification of the preceding one. This process is called:

- a. generalization.
- b. transfer.
- c. higher-order conditioning.
- d. shaping.

24. When training the dolphin to jump through a loop, the trainer starts at a height of one foot above the water and increases the height one foot per week. Eventually the dolphin can jump through a hoop ten feet above water. This is an illustration of:

- a. deliberate practice.
- b. trial-and-error.
- c. shaping.
- d. chaining.

25. Which of the following can be construed as evidence that behaviorism is not able to account for all behavior?

- a. the Language Acquisition Device
- b. learning through imitation
- c. the existence of goals
- d. all of the above

### **Constructed Response**

CR1. Explain, using a classical conditioning model, how a child could become fearful of riding a school bus.

CR2. Describe two positive educational outcomes, one of which could arise from classical conditioning, the other from operant conditioning.

CR3. You want to teach a child a new behavior pattern, and you are prepared to use rewards to do so. At some point, however, you want to withdraw the rewards and have the behavior last as long as possible. What's the best strategy to accomplish these goals?

CR4. Suppose you are teaching a class of six-graders. One of the students sitting in the back seems not be able to sit still or pay attention to your instruction. He turns around to talk to his neighbors, and passes notes to them. Using behaviorist principles, describe two approaches that can you use to modify his behavior without inflicting punishment.

CR5. You want to teach Leon to catch a baseball. Describe how you might use "shaping" to teach this skill. Specify: (a) an appropriate terminal behavior, (b) a reinforcer you might reasonably use, and (c) the specific steps you would take during the shaping process.

## Chapter 3: The Cognitive Architecture

### Multiple Choice

1. In an information-processing model, we can think of learning as moving information from:
  - a. short-term (working) memory to long-term memory.
  - b. long-term memory to the sensory register.
  - c. the sensory register to short-term memory.
  - d. long-term memory to short-term memory.
2. In the information-processing model of cognition, short-term memory is where the mind holds:
  - a. a large repository of images, words, and experiences.
  - b. a small amount of information for processing.
  - c. a high-fidelity record of all that we have experienced.
  - d. a compact cluster of dopamine-regulated dendrites.
3. The visual sensory register has a duration of approximately:
  - a. one second.
  - b. one minute.
  - c. one hour.
  - d. one day.
4. Most cognitive psychologists believe memory is made up of what three components?
  - a. sensory register, working memory, long-term memory
  - b. retrieval, working memory, long-term memory
  - c. storage, encoding, sensory register
  - d. storage, meaningful learning, working memory
5. The capacity of STM is in the range of:
  - a. three millimeters.
  - b. seven chunks.
  - c. ten seconds.
  - d. twenty decibels.
6. The worldwide web and long-term memory have similar properties, such as:
  - a. multimodality, concept associations, and searchability by content.
  - b. ease of recall and high-fidelity preservation of information.
  - c. trend lines of crystallized and fluid intelligence.
  - d. certain replacement by new and superior technologies.

7. Memory is sometimes described as multimodal. Probably the two dominant forms of representation in the mind are:

- a. words and images.
- b. numbers and letters.
- c. sounds and smells.
- d. aches and pains.

8. Dual coding theory recognizes the special importance of:

- a. language and images.
- b. iconic and echoic memory.
- c. neurons and synapses.
- d. declarative and procedural knowledge.

9. Susan is introduced to Jerry. She immediately smiles and says, "Hello Jerry." A few minutes later she wants to introduce Jerry to her friend Mary, but cannot remember his name. Based on this information, how far in Susan's memory system did Jerry's name get?

- a. It reached the sensory register.
- b. It reached working memory.
- c. It reached long-term memory.
- d. It never got into the memory system at all.

10. Which one of the following best illustrates the working aspect of working memory?

- a. knowing how to use a pair of scissors
- b. confusing two peoples' names
- c. alphabetizing five names as you hold them in memory
- d. being able to adapt your behavior to a variety of different events

11. Say you can remember your high school graduation in some detail (though your memory may be imperfect.) This memory is most likely to be in the form of:

- a. working memory.
- b. procedural knowledge.
- c. declarative knowledge.
- d. episodic memory.

12. Where does the locus of consciousness reside?

- a. long-term memory
- b. sensory register
- c. corpus callosum
- d. short-term/working memory

13. In the human information processing system, the duration of memory—from shortest to longest—is as follows:

- a. LTM, WM, sensory register
- b. WM, LTM, sensory register
- c. sensory register, WM, LTM
- d. LTM, sensory register, WM

14. The visual sensory register temporarily stores and replays:

- a. 1/2 second of high-fidelity visual memory.
- b. 12 seconds of high-fidelity visual memory.
- c. 1/2 minute of high-fidelity visual memory.
- d. 12 minutes of high-fidelity visual memory.

15. Ever since Grace took a class in Spanish vocabulary at university, she has been having trouble remembering the French words that she learned in high school. This is an example of which of the following?

- a. proactive interference
- b. retroactive interference
- c. assimilation
- d. accommodation

16. If your best exam performance is in the same room where you attended lectures, this can be seen as an instance of:

- a. mastery learning.
- b. task orientation.
- c. encoding specificity.
- d. inductive reasoning.

17. According to the principle of encoding specificity, a student who learns while happy is most likely to recall the learned information later if he is:

- a. happy.
- b. sad.
- c. afraid.
- d. jealous.

18. The human mind is not like a video camera because:

- a. video cameras use magnetic tape and the mind records information digitally.
- b. video cameras select and distort information according to its meaning.
- c. human minds store information indefinitely, but videotape does not.
- d. human memories are not accurate recordings of events.